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Case: CL/V-19623/A/CVE42



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: HAGMANN, P., ET AL.

ART UNIT: 1307

SERIAL NO.: 08/274,942

EXAMINER: VARGOT, M.

FILED ON: JULY 14, 1994

FOR: A PROCESS AND DEVICE FOR  
MANUFACTURE OF MOULD-  
INGS AND MOULDINGS MANU-  
FACTURED IN ACCORDANCE  
WITH THAT PROCESS

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APPEAL BRIEF TRANSMITTAL

Sir:

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Respectfully submitted,



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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

APPLICANT: P. HAGMANN ET AL.

APPLICATION No.: 08/274,942

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ART UNIT: 1307

EXAMINER: M. VARGOT

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MOULDINGS AND MOULDINGS MANUFACTURED  
IN ACCORDANCE WITH THAT PROCESS

**APPEAL BRIEF**

Michael U. Lee  
CIBA-GEIGY CORPORATION

Date: September 12, 1996

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Pursuant to 37 C.F.R. §1.192, Applicants respectfully submit this Appeal Brief in response to the Final Rejection, dated April 16, 1996, and Applicants' Notice of Appeal Filed on July 15, 1996.

#### STATUS OF CLAIMS

Claims 1-5, 8-40, 42-61 and 63-81 remain in the application with all the claims being finally rejected. No claim has been allowed. The claims are set forth in the attached Appendix.

#### REAL PARTY IN INTEREST

The rights to the application and any patent issuing therefrom were assigned to Ciba-Geigy Corporation, Tarrytown, New York. Accordingly, the real party in interest is Ciba-Geigy Corporation.

#### STATUS OF AMENDMENTS SUBSEQUENT TO FINAL REJECTION

An amendment after final rejection was agreed in a telephonic interview between Examiner Vargot and Applicants' representative, Michael Lee, on September 5, 1996. The Examiner agreed to enter an examiner's amendment to delete the term "impermeable" and substitute therefor --permeable-- in claim 1, line 5. The amendment corrects a typographical error and places the claim in better form for consideration on appeal. In addition, the amendment, removes the new matter objection indicated in the Advisory Action, dated June 21, 1996.

## SUMMARY OF THE INVENTION

The present invention is directed to a one-step process for producing a molded polymeric article, such as a contact lens, and the molded article is formed by impinging crosslinking energy onto a crosslinkable material in a mold. One of unique features of the invention is that the edge of the molded article is formed by controlling the area of the crosslinking energy impingement. Unlike conventional molding processes in which the entire polymerizable material in the mold is completely polymerized and, thus, the edge of the molded article is defined by the edge of the mold, the present invention does not polymerize or crosslink the entire material in the mold. For example, using a masking material that prevents the crosslinking energy from reaching the crosslinkable material, a mask having a void is positioned over the mold and only the crosslinkable material inside the contour of the void is allowed to crosslink. Consequently, the outer edge of the molded article corresponds to the void contour of the mask, and the resulting fully-formed molded article has no flash attached thereto.

The molding technique of the present invention is highly advantageous over conventional molding processes in that the molded article does not have attached flashes and the movement of the polymerizable material due to shrinkage or expansion during the crosslinking step is simply and uniquely accommodated. Additionally, the molded article produced in accordance with the present invention does not have to go through a flash-removing secondary shaping process that is often required in a conventional molding process.

## ISSUES

1. Whether U.S. Patent No. 4,113,224 to Clark et al. establishes a *prima facie* case of obviousness of Claims 1-4, 8-40, 42-61 and 63-81 under 35 U.S.C. §103.

2. Whether U.S. Patent No. 4,113,224 to Clark et al. in view of European Patent Application No. 484 015 establishes a *prima facie* case of obviousness of Claim 5 under 35 U.S.C. §103.

3. Whether U.S. Patent No. 4,113,224 to Clark et al. or U.S. Patent No. 4,113,224 in view of European Patent Application No. 484 015 makes obvious Claims 1-5, 8-40, 42-61 and 63-81 under 35 U.S.C. §103.

### GROUPING OF CLAIMS

All of the pending Claims 1-5, 8-40, 42-61 and 63-81 are believed to stand or fall together.

### ARGUMENT

**1. Whether U.S. Patent No. 4,113,224 to Clark et al. establishes a *prima facie* case of obviousness of Claims 1-4, 8-40, 42-61 and 63-81 under 35 U.S.C. §103.**

Applicants respectfully submit that the rejection is in error on the law and the facts and that Claims 1-4, 8-40, 42-61 and 63-81 are not *prima facie* obvious over U.S. Patent No. 4,113,224 to Clark et al. (Clark) in the context of 35 U.S.C. §103. Applicants submit that Clark does not suggest nor appreciate the present one-step masking process for forming molded articles and does not even recognize the utility of the one-step masking process for producing molded articles.

As is well established in patent law, the PTO has the initial burden of presenting a *prima facie* case of obviousness under 35 U.S.C. §103, and if the PTO fails to establish a *prima facie* case of obviousness, the 35 U.S.C. §103 rejection is improper and should be

overturned. See, for example, **In re fine**, 5 USPQ2d 1596 (Fed. Cir. 1988). In order to establish a *prima facie* case of obviousness, there must be some reasonable expectation of success in the cited prior art. See, for example, **In re Clinton**, 188 USPQ 365 (CCPA 1976). If the PTO does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of the patent. See, for example, **In re Grabiak**, 226 USPQ 870 (Fed. Cir. 1985). Only when the initial burden of presenting a *prima facie* case of obviousness is met, the burden of coming forward with evidence or argument shifts to the applicant, and after the applicant submits such evidence in response, patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument. See, for example, **In re Oetiker**, 24 USPQ2d 1443 (Fed. Cir. 1992).

The basis for the 35 U.S.C. §103 rejection of Claims 1-4, 8-40, 42-61 and 63-81 over Clark stated in the final rejection Office Action is as follows:

“ A monomeric material is one that is “crosslinkable” and that is “in a state in which it is at least partially uncrosslinked” when introduced into the mold as set forth in the instant claims. In the process of Clark et al, it is submitted that the edge contour of the molding is determined substantially by the energy impingement; to produce the molding in the Clark et al with no burr or flash would have been obvious if desiring to do so. Note column 7, lines 46-55, wherein it is taught that polymerization of the material in the reservoir is merely a preferred embodiment, to facilitate further handling. On of ordinary skill, not requiring same, would have found polymerization only the lens portion in Clark et al to have been totally obvious dependent on need.” (emphasis added)

Clark is directed to a lens mold which is designed to produce an unfinished contact lens by a sequential two-step polymerizing process. According to Clark, the polymerized unfinished contact lens has an extra material or flash attached to the molded lens, and the unfinished contact lens is further processed to remove the flash. See, for example, at column 8, lines 49-52, of Clark. Clark does not even contemplate nor appreciate the



existence of a method that produces a flash-less molded article such that the flash removing step can be eliminated.

It has been known in the art that typical polymerizable lens-forming materials shrink or expand when they polymerize. Clark's mold is specifically designed to accommodate this shrinkage or expansion, especially shrinkage, of the lens-forming material when the material is polymerized by an irradiating method. Clark's process uses a lens mold that has a mold cavity, in which the lens is formed; a reservoir, which retains an excess amount of the lens-forming material to replenish the cavity in response to the shrinkage; and an annular restriction, which separates the cavity and the reservoir and allows fluid communication thereof. Because the annular restriction contains only a small amount of the lens-forming material, the material in the annular restriction will polymerize first if the whole mold is exposed to the polymerizing radiation, thereby cutting off the fluid communication between the cavity and the reservoir and defeating the supplying function of the reservoir. To overcome this problem, Clark discloses a two-step process for polymerizing the lens-forming material. First, a diaphragm having an opening smaller than the diameter of the lens body being formed is placed in the pathway between the mold and the radiation source in order to insure that the lens-forming material in and near the annular restriction is shielded from the radiation, thereby polymerizing the center portion of the lens and accommodating the shrinkage by supplying the lens-forming material from the reservoir through the restriction. After the center portion of the lens is polymerized, the diaphragm is removed and the rest of the mold is exposed to the radiation, completing the lens polymerization process. The resulting polymerized lens has an extra polymerized material or flash attached thereto, which was formed by the lens-forming material in the reservoir and/or the restriction. As indicated, for example, at column 8, lines 49-52, of Clark, the polymerized lens is further processed to remove the flash.

Applicants respectfully submit that the above underlined portion of the basis for the rejection inaccurately suggests that Clark teaches a molding process that produces a flash-less molded article. At column 2, lines 56-61, of Clark, it is clearly indicated that the edge

of the lens is defined by the annular restriction and that there must be a removing process or "edge contouring process" to remove the flash from the lens. And, as stated above, Clark at column 8, lines 49-52, also clearly states that the polymerized lens needs to be further processed to remove the flash that was formed by the reservoir and/or the restriction. Consequently, it is clear that Clark does not suggest nor even contemplate a flash-less molded article.

In fact, when column 7, lines 46-55, of Clark is read within the context of the disclosure, it is clear that the section merely teaches why the polymerizable material in the reservoir may not be polymerized and why it is highly desirable to polymerize the material in the reservoir. Alternatively stated, it is not Clark's intention at all to prevent polymerization of the material in the reservoir, and the polymerizable material in the reservoir may be undesirably prevented from being polymerized due to the contact with air since the reservoir is exposed to air. Unlike the material in the reservoir, the material in the restriction is not exposed to air, and the material is polymerized. Applicants submit that Clark teaches a molded article that has an attached flash which is formed by the material in the restriction area and, desirably, in the restriction and reservoir areas. Accordingly, Clark does not teach or suggest a flash-less molded article, and Clark only teaches a process that requires an additional flash removing step to produce a fully-formed article.

Consequently, Applicants respectfully submit that it is improper to conclusorily state that producing a molded article with no flash would have been obvious in view of Clark if so desired (as recited above in the italicized portion of the Office Action) when Clark teaches a highly different molded article production process and does not even appreciate nor suggest a flash-less molded article. Applicants respectfully submit that the obviousness conclusion stated in the Office Action is merely a conclusory statement and not supported by any evidence.

Moreover, there is no suggestion or recognition in Clark at all that Clark's two-step polymerizing process can be modified for any reason. In hindsight, after reading the

specification of the present invention, it may be improperly asserted that the first step of Clark's process can be modified to resemble the present process. However, there is no suggestion or recognition in Clark at all that Clark's two-step process can be stopped in the middle for any reason. As such, Clark does not even recognize the utility for forming a fully-formed molded article with a masking process. Consequently, Clark utterly lacks any suggestion and/or any expectation of success for a one-step molding process that uses a mask to produce a fully-formed molded article.

Applicants respectfully submit that the present invention is not *prima facie* obvious over Clark when Clark teaches a highly different process that requires an additional step to remove the flash, does not even suggest or recognize a one-step molding process, and does not provide any expectation of success. Applicants submits that the PTO has failed to established a *prima facie* case of obviousness.

**2. Whether U.S. Patent No. 4,113,224 to Clark et al. in view of European Patent Application No. 484 015 establishes a *prima facie* case of obviousness of Claim 5 under 35 U.S.C. §103.**

Applicants respectfully submit that the rejection is in error on the law and the facts and that Claim 5 is not *prima facie* obvious over U.S. Patent No. 4,113,224 to Clark et al. (Clark) in view of European Patent Application No. 484 015 ('015) in the context of 35 U.S.C. §103. Applicants believe that Clark was cited for the same proposition discussed above in Argument No. 1, and '015 was cited for the proposition that a mold made of parts having different permeabilities to crosslinking energy.

Although the secondary reference '015 may teach mold parts made from polymers having different energy permeabilities, this teaching does not alter or supplement the fact that Clark does not teach or suggest a one-step molding process. As fully discussed above, Clark teaches a two-step molding process that necessarily produces a molded

article which is larger than the final article to be produced such that the edge can be trimmed away, and Clark does not even suggest or recognize a one-step molding process and does not provide any expectation of success for such one-step process.

Applicants submit that Claim 5 is not *prima facie* obvious over Clark in view of '015 since Clark requires an additional step to remove the flash attached to the molded article and does not even suggest or recognize a one-step molding process, and '015 does not add anything more to supplement these deficiencies of Clark. Applicants submit that the PTO has failed to establish a *prima facie* case of obviousness.

**3. Whether U.S. Patent No. 4,113,224 to Clark et al. or U.S. Patent No. 4,113,224 in view of European Patent Application No. 484 015 makes obvious Claims 1-5, 8-40, 42-61 and 63-81 under 35 U.S.C. §103.**

Applicants submit that, *arguendo*, even if it is assumed that the PTO has established a *prima facie* case of obviousness, Claims 1-5, 8-40, 42-61 and 63-81 are not obvious over Clark or Clark in view of '015 since Clark teaches a highly different process for producing a molded article.

As fully discussed above, Clark's process requires not only a molding step but also a post-molding flash trimming step. Additionally, Clark's molding process is a two-step molding process. In contrast, the present process is a one-step molding process and does not require an extraneous trimming step. Consequently, Applicants submit that Clark's process is not even comparable to the present one-step molded article production process. Applicants respectfully submit that Claims 1-5, 8-40, 42-61 and 63-81 are not obvious over Clark or Clark in view of '015.

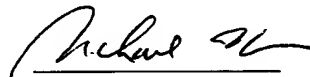
Applicants submit that even if it is assumed that the PTO has established a *prima facie* case of obviousness, Claims 1-5, 8-40, 42-61 and 63-81 are not obvious over Clark or Clark in view of '015.

### CONCLUSION

In summary, the present invention that produces a fully formed molded article with a one-step process is not *prima facie* obvious or obvious over Clark's process, which requires two molding steps and an extraneous trimming step to produce a fully-formed molded article. In addition, '015 does not provide anything more to correct the deficiencies of Clark. Applicants submit that Claims 1-5, 8-40, 42-61 and 63-81 are not obvious over Clark or Clark in view of '015. Allowance of the appealed claims is respectfully requested.

The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. 07-0590.

Respectfully submitted,  
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## APPENDIX

1. A process for the manufacture of mouldings that are crosslinked in a mould at least to a degree sufficient to be released from the mold, in which process a crosslinkable material that is in a state in which it is at least partially uncrosslinked is introduced into the mould, the mould having a cavity determining the shape of the moulding to be produced and being at least partially permeable to an energy suitable to cause the crosslinking by impingement of the energy upon the at least partially uncrosslinked material, wherein the impingement of the energy causing the crosslinking upon the at least partially uncrosslinked material is restricted to the cavity and wherein the edge contour of the moulding is determined substantially by the spatial restriction of the energy impingement, so that a moulding is produced free from burrs or flashes.
2. A process according to claim 1, wherein the spatial restriction of the energy impingement is effected by masking of the mould, the masking being at least partially impermeable to the energy causing the crosslinking.
3. A process according to claim 1, wherein the energy employed to cause the crosslinking is radiation energy.
4. A process according to claim 3, wherein the radiation energy is in the form of a substantially parallel beam.
5. A process according to claim 1, wherein the mould used is one that is highly permeable at least at one side to the energy causing the crosslinking, and the spatial restriction of the energy impingement is effected by parts of the mould that are impermeable or of poor permeability to the energy causing the crosslinking.

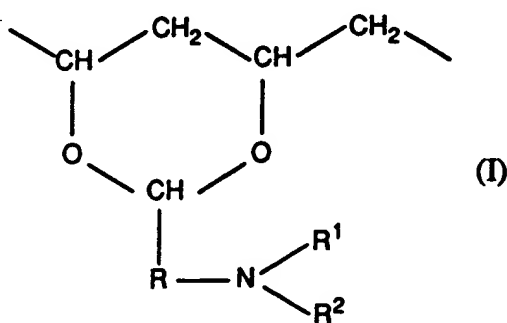
8. A process according to claim 1, wherein the mould is not fully closed after the introduction of the material into the mould cavity, so that at least a gap containing uncrosslinked material remains open, which gap is in communication with the mould cavity and preferably surrounds it, and wherein the energy causing the crosslinking is kept away from the material disposed in that gap.
9. A process according to claim 8, wherein the mould is closed further following crosslinking shrinkage as crosslinking of the material progresses.
10. A process according to claim 8, wherein a material that is of at least viscous flowability prior to crosslinking is used, and a reservoir that is not impinged upon by the energy causing the crosslinking is provided from which material can flow back through the gap into the mould cavity to compensate for shrinkage.
11. A process according to claim 1, wherein, after the moulding has been released from the mould, any uncrosslinked or only partially crosslinked material adhering to the moulding is removed by washing with a suitable solvent.
12. A process according to claim 1, wherein the mould is closed without force, so that the two mould halves lie against one another without external pressure.
13. A process according to claim 1, wherein the filling of the mould cavity is carried out with the mold at least partially immersed in the starting material that is at least partially still in the uncrosslinked state.
14. A process according to claim 13, wherein, for filling the mould cavity, the cavity is connected to a reservoir which surrounds it, in which the starting material is stored and from which the mould cavity is flooded.

15. A process according to either claim 13, wherein the mould is closed in the starting material.
16. A process according to claim 13, wherein a mould is used that comprises a container and a mould member that is displaceable in that container and can be moved away from and towards the container wall lying opposite it for the purpose of opening and closing the mould, starting material being fed in between the container wall and the mould member as the mould is opened and conveyed away again as the mould is closed.
17. A process according to claim 16, wherein a mould having two mould halves is used in which one mould half is provided on the container wall and the other mould half is provided on the displaceable mould member.
18. A process according to claim 17, wherein a mould having a male mould half and a female mould half is used, the male mould half being provided on the container wall and the female mould half being provided on the displaceable mould member.
19. A process according to claim 16, wherein pumps are used to feed in and convey away the starting material.
20. A process according to claim 16, wherein the displaceable mould member is driven in order to feed in and convey away the starting material.
21. A process according to claim 13, wherein the crosslinked moulding can be released from the mould by flushing out the mould with starting material.



22. A process according to claim 16, wherein the crosslinked moulding can be released from the mould by flushing out the mould with starting material, and  
wherein the moulding is separated from the mould by the flow of starting material as the mould is opened and is flushed out of the mould by the flow of starting material as the mould is closed.
23. A process according to claim 21, wherein in a first cycle the mould is opened and closed again, then at least the crosslinking necessary for it to be possible for the moulding to be released from the mould is effected by the impingement of energy and, in a second cycle, the mould is opened again, the moulding being separated from the mould and the mould member then being moved back towards the opposite-lying container wall again in order to close the mould, in the course of which the crosslinked moulding is flushed out of the mould.
24. A process according to claim 13, wherein the crosslinked moulding is removed from the mould by means of a gripping device.
25. A process according to claim 16, wherein the crosslinked moulding is removed from the mould by means of a gripping device, and  
wherein the moulding removed from the mould by the gripping device is deposited on the displaceable mould member outside the space between the displaceable mould member and the opposite-lying wall.
26. A process according to claim 25, wherein the moulding deposited on the displaceable mould member is held fast thereto by negative pressure and then released from it by positive pressure.

27. A process according to claim 13, wherein the mould is not fully closed after the introduction of the starting material into the mould cavity, so that an annular gap containing uncrosslinked starting material remains open, which gap surrounds the mould cavity and is in communication with that mould cavity.
28. A process according to claim 27, wherein the mould is closed further following crosslinking shrinkage as crosslinking of the material progresses.
29. A process according to claim 28, wherein a starting material that is of at least viscous flowability prior to the crosslinking is used, and wherein starting material can flow back through the annular gap into the mould cavity to compensate for shrinkage.
30. A process according to claim 1, wherein the starting material is a prepolymer that is a derivative of a polyvinyl alcohol having a molecular weight of at least about 2000 that, based on the number of hydroxy groups of the polyvinyl alcohol, comprises from approximately 0.5 to approximately 80 % of units of formula I



wherein

R is lower alkylene having up to 8 carbon atoms,

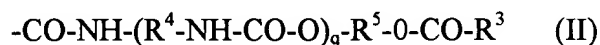
R<sup>1</sup> is hydrogen or lower alkyl and

R<sup>2</sup> is an olefinically unsaturated, electron-withdrawing, copolymerisable radical preferably having up to 25 carbon atoms.

31. A process according to claim 30, wherein the starting material is a prepolymer wherein  $R^2$  is an olefinically unsaturated acyl radical of formula  $R^3$ -CO-, in which  $R^3$  is an olefinically unsaturated copolymerisable radical having from 2 to 24 carbon atoms, preferably from 2 to 8 carbon atoms, especially preferably from 2 to 4 carbon atoms.

32. A process according to claim 31, wherein the starting material is a prepolymer wherein  $R^3$  is alkenyl having from 2 to 8 carbon atoms.

33. A process according to claim 30, wherein the starting material is a prepolymer wherein the radical  $R^2$  is a radical of formula II



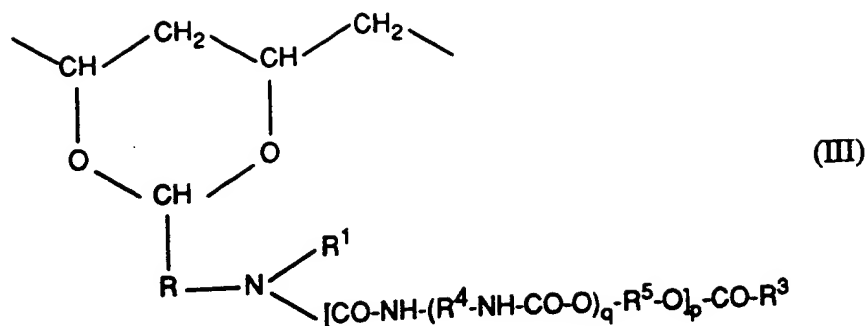
wherein

q is zero or one and

$R^4$  and  $R^5$  are each independently lower alkylene having from 2 to 8 carbon atoms, arylene having from 6 to 12 carbon atoms, a saturated divalent cycloaliphatic group having from 6 to 10 carbon atoms, arylenealkylene or alkylenearylene having from 7 to 14 carbon atoms or arylenealkylenearylene having from 13 to 16 carbon atoms, and

$R^3$  is an olefinically unsaturated copolymerisable radical having from 2 to 24 carbon atoms, preferably from 2 to 8 carbon atoms, especially preferably from 2 to 4 carbon atoms.

34. A process according to claim 30 wherein the prepolymer is a derivative of a polyvinyl alcohol having a molecular weight of at least about 2000 that, based on the number of hydroxy groups of the polyvinyl alcohol, comprises from approximately 0.5 to approximately 80 % of units of formula III



wherein

R is lower alkylene,

R<sup>1</sup> is hydrogen or lower alkyl,

p is zero or one,

q is zero or one,

R<sup>3</sup> is an olefinically unsaturated copolymerisable radical having from 2 to 8 carbon atoms

and

R<sup>4</sup> and R<sup>5</sup> are each independently lower alkylene having from 2 to 8 carbon atoms, arylene having from 6 to 12 carbon atoms, a saturated divalent cycloaliphatic group having from 6 to 10 carbon atoms, arylenealkylene or alkylenearylene having from 7 to 14 carbon atoms or arylenealkylenearylene having from 13 to 16 carbon atoms.

35. A process according to claim 34, wherein the starting material is a prepolymer wherein

R is lower alkylene having up to 6 carbon atoms,

p is zero and

R<sup>3</sup> is alkenyl having from 2 to 8 carbon atoms.

36. A process according to claim 34, wherein the starting material is a prepolymer wherein

R is lower alkylene having up to 6 carbon atoms, p is one,  
q is zero,  
R<sup>5</sup> is lower alkylene having from 2 to 6 carbon atoms and  
R<sup>3</sup> is alkenyl having from 2 to 8 carbon atoms.

37. A process according to claim 34, wherein the starting material is a prepolymer wherein R is lower alkylene having up to 6 carbon atoms,  
p is one,  
q is one,  
R<sup>4</sup> is lower alkylene having from 2 to 6 carbon atoms, phenylene, unsubstituted or substituted by lower alkyl, cyclohexylene or cyclohexylene-lower alkylene, unsubstituted or substituted by lower alkyl, phenylene-lower alkylene, lower alkylene-phenylene or phenylene-lower alkylene-phenylene,  
R<sup>5</sup> is lower alkylene having from 2 to 6 carbon atoms and  
R<sup>3</sup> is alkenyl having from 2 to 8 carbon atoms.

38. A process according to claim 30, wherein the starting material is a prepolymer that is a derivative of a polyvinyl alcohol having a molecular weight of at least about 2000 that, based on the number of hydroxy groups of the polyvinyl alcohol, comprises from approximately 1 to approximately 15 % of units of formula I.

39. A process according to claim 1, wherein one half of the mould is used as packaging for the contact lens.

40. A device for the manufacture of mouldings comprising:  
a closable and openable mould defining a mould cavity which is capable of determining the shape of a moulding to be produced therein, wherein the mould is at least

partially permeable to an energy suitable to cause crosslinking of a crosslinkable material to be introduced into the mould;

a source of energy suitable to cause crosslinking;

means for causing impingement of the energy upon the mould, wherein the means for causing the impingement of the energy upon the mould is arranged such that the energy is restricted to the mould cavity and that the edge contour of the moulding is determined substantially by the spatial restriction of the energy impingement, so that a moulding is produced free from burrs or flashes.

42. A device according to claim 41, wherein the mould comprises two mould halves which are separated along a separating face, and wherein the mask is arranged outside the mould cavity on one of the two mould halves and/or on both mould halves in the region of the separating face.

43. A device according to claim 42, wherein the source generates UV radiation and wherein at least one of the halves of the mould consists of UV-permeable material.

44. A device of claim 43, wherein the mask consists of a layer of material that is impermeable to UV radiation.

45. A device according to claim 40, wherein the mould is provided with spacers which hold the two mould halves a small distance apart from one another when the mould is in the closed position, so that at least a gap is formed that preferably surrounds the mould cavity and is in communication with that cavity, and wherein the mask is arranged in the region of the gap.

46. A device according to claim 45, wherein the mould is provided with resilient means or displacement means that allow the two mould halves to move closer together following crosslinking shrinkage.

47. A device according to claim 40, wherein during filling of the mould cavity the mold is at least partially immersed in starting material that is at least partially still in the uncrosslinked state.

48. A device according to claim 47 which comprises a reservoir for supplying the starting material, which reservoir surrounds the mould cavity and can be connected to the mould cavity, and wherein during filling of the mould cavity the reservoir is connected to the mould cavity and floods that cavity.

49. A device according to claim 47, which comprises means for closing the mould while the mould is at least partially immersed in the starting material.

50. A device according to claim 47, wherein the mould comprises a container and a mould member displaceable in that container, which mould member can be moved away from and towards the container wall lying opposite it for the purpose of opening and closing the mould, and wherein there is provided in the container an inlet through which starting material flows in between the container wall and the mould member as the mould is opened, and wherein there is provided in the container an outlet through which starting material flows out again as the mould is closed.

51. A device according to claim 50, wherein the mould comprises two mould halves, one mould half being provided on the container wall and the other on the displaceable mould member.

52. A device according to claim 51, wherein the mould comprises a male mould half and a female mould half, and wherein the male mould half is provided on the container wall and the female mould half is provided on the displaceable mould member.

53. A device according to claim 50, wherein pumps are provided which, as the mould is opened, feed in starting material through the inlet and between the container wall and the mould member and, as the mould is closed, convey it back through the outlet.

54. A device according to claim 50, wherein means are provided for driving the displaceable mould member.

55. A device according to claim 47, wherein means are provided for producing a flow that separates the moulding from the mould when the mould is opened and flushes the moulding out of the mould when the mould is closed.

56. A device according to claim 50, wherein means are provided for producing a flow that separates the moulding from the mould when the mould is opened and flushes the moulding out of the mould when the mould is closed, and

wherein, in a first cycle, starting material first of all flows in through the inlet and between the container wall and the displaceable mould member and then flows back out through the outlet, the source for the energy then acts upon the mould with an amount of energy necessary for it to be possible for the moulding to be released from the mould, and then, in a second cycle, starting material flows in through the inlet and between the container wall and the displaceable mould member separates the moulding from the mould and then flushes it out through the outlet.

57. A device according to claim 47, wherein a gripping device is provided which removes the crosslinked moulding from the mould.



58. A device according to claim 50, wherein a gripping device is provided which removes the crosslinked moulding from the mould, and

wherein the container comprises, on a container wall other than the shape-giving face, a hollow or recess that extends substantially in the direction of movement of the displaceable mould member, the gripping device being arranged in that hollow or recess, and wherein the displaceable mould member comprises, on an outer wall that does not lie opposite the shape-giving container wall, an indentation in which the gripping device deposits the removed moulding.

59. A device according to claim 58, wherein the displaceable mould member comprises a channel that leads to the indentation and can be connected to a negative pressure or positive pressure source, which channel is connected to the negative pressure source when the gripping device deposits the removed moulding in the indentation of the mould member and then is connected to the positive pressure source in order to release the lens.

60. A device according to claim 51, wherein the mould is provided with spacers that hold the two mould halves a small distance apart from one another when the mould is in the closed position, so that an annular gap is formed that surrounds the mould cavity and is in communication with that cavity.

61. A device according to claim 60, wherein the mould is provided with resilient means or displacement means that allow the two mould halves to move closer together following crosslinking shrinkage.

63. A process of claim 1, wherein said molding is an optical lens.

64. A process of claim 1, wherein said molding is a contact lens.

65. A process of claim 3, wherein the radiation energy is UV radiation.
66. A process of claim 3, wherein the radiation energy is gamma radiation.
67. A process of claim 3, wherein the radiation energy is electron radiation.
68. A process of claim 3, wherein the radiation energy is thermal radiation.
69. A process of claim 4, wherein the masking is effected by a mask that is impermeable or of poor permeability to the crosslinking energy and wherein the mask is provided on or in the mould but outside the mould cavity.
70. A process of claim 69, wherein the mould comprises different mould members and the mask is arranged in the region of separating planes or separating faces of different mould members.
71. A process of claim 70, wherein the mask is provided on the separating face of one of the mould members.
72. A process of claim 70, wherein the mask is arranged such that it is in contact with the crosslinkable material.
73. A process according to claim 71, wherein the mould is not fully closed after the introduction of the material into the mould cavity, so that at least a gap containing uncrosslinkable material remains open, the gap being in communication with the mould cavity, and wherein the crosslinking energy is restricted from the material disposed in the gap by means of a mask.

74. A process of claim 73, wherein the mould is closed further following crosslinking shrinkage as crosslinkage of the material progresses.

75. A device of claim 40, wherein the means for causing the impingement of the energy comprises a mask provided on the mould, the mask being impermeable or of poor permeability to the energy causing the crosslinking.

76. A device of claim 43, wherein the UV-permeable material is quartz.

77. A device of claim 44, wherein the layer is a metal oxide layer.

78. A device of claim 77, wherein the layer is a chrome layer.

79. A process for the manufacture of a crosslinked moldings, comprising the steps of:

(a) introducing a crosslinkable material into a cavity of a mold;

(b) causing crosslinking energy to be impinged on said mold in an amount sufficient to crosslink said material to a degree sufficient to form a molding capable of being released from said mold, said mold cavity substantially determining the shape of the molding to be produced; and

(c) restricting impingement of said crosslinking energy on said crosslinkable material to the shape-forming cavity of the mold;

wherein said mold is at least partially impermeable to said crosslinking energy and

wherein the edge contour of the molding is determined substantially by the spatial restriction of the energy impingement, thereby producing a molding substantially free from burrs or flashes.

80. A process of claim 79, wherein said molding is an ophthalmic lens.

81. A process of claim 80, wherein said ophthalmic lens is a contact lens.